1.4

Solving Exponential & Logarithmic Equations

Name _____ **Date** _____ **Period** _____

Find the exact solution algebraically, and check it by substituting into the original equation. Show work!

1. $32\left(\frac{1}{4}\right)^{x/3}=2$

2. $36\left(\frac{1}{3}\right)^{x/5}=4$

3. $3\cdot 4^{x/2}=96$

4. $2\cdot 5^{x/4}=250$

5. $3\left(5^{-x/4}\right)=15$

6. $2\left(10^{-x/3}\right)=20$

7. $\log_2 x=5$

8. $\log x=3$

9. $\log_4(1-x)=1$

10. $\log_4(x-5)=-1$

Solve each equation. If necessary, obtain a numerical approximation for your solution by rounding to the nearest ten thousandths. Check your solution by substituting into the original equation. Show work!

11. $1.08^x = 6.45$

12. $0.95^x = 1.3$

13. $40e^{0.025x} = 200$

14. $90e^{0.035x} = 360$

15. $3 + 2e^{-x} = 11$

16. $7 - 4e^{-x} = -5$

State the domain of each function. Then match the function with its graph.

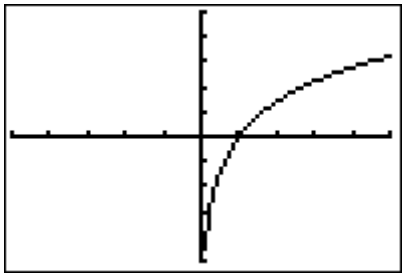
(Graph windows [-5, 5] by [-5, 5].)

17. $f(x) = \log[x(x+1)]$

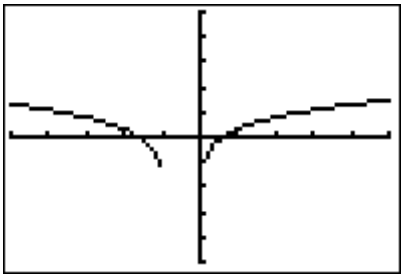
18. $f(x) = \ln\dfrac{x}{x+1}$

19. $f(x) = 2\ln x$

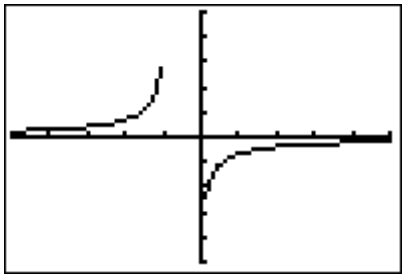
a)



b)



c)



20. A cake is removed from an oven at 350°F and cools to 120ºF after 20 minutes in a room at 65ºF. How long will the cake take to cool to 90ºF?